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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,725	02/28/2002	Toshihito Tsuga	TI-31621	1672

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EXAMINER

KORNAKOV, MICHAEL

ART UNIT PAPER NUMBER

1746

DATE MAILED: 01/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/085,725	Applicant(s) TSUGA ET AL.	
	Examiner Michael Kornakov	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☒ Claim(s) 1-7 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-6, drawn to a method for removing particles on semiconductor wafers, classified in class 134, subclass 1.3.
 - II. Claim 7, drawn to a device for removing particles on semiconductor wafers, classified in class 134, subclass 56R.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions of Group I and Group II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be utilized for forming ornamental articles by wet etching.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Ms. J. Garner on 1/9/2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-6.

Affirmation of this election must be made by applicant in replying to this Office action.

Claim 7 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thornton*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1,2,3,5 and 6 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,3

and 7 of copending Application No. 10/085753. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1, 3, and 7 of the Application 10/085753 recite a method of removing particles on semiconductor wafers comprising the steps of immersing them in a cleaning solution consisting of ultra-pure water containing a prescribed quantity of ozone, immersing them in a cleaning solution consisting of HF mixed solution and immersing them in a cleaning solution containing ultra-pure water with prescribed quantity of hydrogen, which is in the same range (0.3 ppm to 0.8 ppm) as instantly claimed. Therefore, the instant claims 1,2,3,5 and 6 are obvious variances of claims 1,3 and 7 of copending Application No. 10/085753.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Specification

9. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Claim 4 recites the step of performing a **fifth cleaning process** in which semiconductor wafers are cleaned by immersing them in a fifth cleaning solution consisting of ultra-pure water, before semiconductor wafers are cleaned in a forth cleaning solution, consisting of HF mixed solution. However, the instant specification lacks the step, described by claim 4. Appropriate correction is required.

Claim Objections

10. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 6 depends on claim 1 and recites that the first cleaning solution contains hydrochloric acid. However, claim 1 recites the step of performing a first cleaning process, wherein a first cleaning solution **consists of** ultra-pure water containing a prescribed quantity of ozone.

The transitional phrase "consisting of" excludes any **element, step, or ingredient** not specified in the claim. **A claim, which depends from a claim, which "consists of" the recited elements or steps cannot add an element or step,** consult *In re Gray*, 53 F.2d 520, 11 USPQ 255 (CCPA 1931); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948). Applicant is required to cancel the claim, or amend the claim to place it in proper dependent form, or rewrite the claim in independent form. Accordingly, claim 6 in its present form has not been treated on the merits.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1, 2, 3, 5 and 6 are rejected under 35 U.S.C. 102(a) or 102(e) as being anticipated by Matsuno et al (US 2001/0009155).

Matsuno teaches a method for removal of fine particles, existing on semiconductor substrate, by treating the said substrate with ozone water, which has been prepared by dissolving an ozone containing gas in ultra-pure water (reads on the "second cleaning process" performed before the first cleaning process, as instantly claimed); and treating the said substrate with hydrogen water, which has been prepared by dissolving a hydrogen containing gas in ultra-pure water (reads on the "first cleaning process", as instantly claimed), wherein the treatment with hydrogen water is enhanced by applying ultrasonic waves (page 12, claim 1; page 4, paragraph 0046). Matsuno also teaches treating the substrate with HF-containing water (reads on the "third cleaning process", as instantly recited in claim 3) after the step in which the substrate is treated with said ozone water, and said hydrogen water. Matsuno specifically indicates that his cleaning method can be realized utilizing soaking treatments of substrate in ozone water and hydrogen water (page 10, paragraph 0087) and therefore the step of immersing substrate in respective cleaning solution is inherent in Matsuno's teaching. With specific regard to claim 3, Matsuno teaches that Hydrogen water for use in the present invention can be obtained by bringing a hydrogen-containing gas, which has been produced by a known hydrogen generator, into contact with ultrapure water. The concentration of hydrogen in the hydrogen water may preferably be 0.5 ppm or higher [0042], thus anticipating the instantly claimed range.

Thus, all the limitations of instant claims 1, 2, 3, 5, and 6 are explicitly or inherently met by Matsuno et al.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuno et al (US 2001/0009155) in view of Yeol et al (U.S. 6,039,815)

Matsuno does not specifically indicate the presence of ammonia in the first cleaning solution comprising water and hydrogen. Use of ammonia in semiconductor cleaning solutions is a routine procedure in the art. In fact, commercial cleaning solutions, such, as SC-1 contain ammonia. Yeol disclose a method for cleaning a semiconductor substrate using hydrogen water (wherein hydrogen is dissolved in ultra pure water) and/or ozone water (see abstract) , specifically describing the embodiment wherein the object is washed with an aqueous reducing alkaline solution prepared by mixing hydrogen water and alkaline solution (col.2, lines 64-67). Especially interesting is Example 3 in col.10, wherein Yeol provides for an aqueous reducing alkaline cleaning solution used for washing. The aqueous cleaning solution was prepared by mixing 2 mmol/l ammonia water and a hydrogen water having a concentration of 1 to 2 PPM at a mixing ratio of 1 liter to 1 liter. Cleaning was carried out by jetting the aqueous cleaning solution on the surface a liquid crystal display substrate for 5 min. Yeol further provides the motivation on the combined use of a hydrogen water and ammonia, showing that the cleaning performed with ammonia water alone does not achieve the removal of particles that is achieved using a combination.

Therefore, those skilled in the art at the time the invention was made would have found obvious to add the ammonia solution to a hydrogen water, as done by Yeol in the cleaning solution of Matsuno in order to reduce the number of particles adhered to a substrate, and will thus arrive at the instant claim 4.

Therefore, combination of references renders claim 4 prima facie obvious and properly rejected under 35 USC 103 (a).

17. Applicant should note that additional prior art cited in PTOL-892 shows general state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (703) 305-0400. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (703) 308-4333. The fax phone number for the organization where this application or proceeding is assigned is (703) 872 9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 2450.

M. KORNAKOV

01/09/04

Michael Kornakov
Examiner
Art Unit 1746